# TA33 Motherboard

**3.5" Fanless SBC with TI AM3354 Processor.**

# User Manual / Engineering Spec.

**Version 1.1**

## FCC Statement

This device complies with part 15 FCC rules. Operation is subject to the following two conditions：

- This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class "a" digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at him own expense.

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## Disclaimer

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## Warranty

We warrant that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. If the customer discovers a defect, We will, at its option, repair or replace the defective product at no charge to the customer, provided it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service.

If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W11Axxxxxxxx means October of year 2011.

## *Packing List*

Before using this Motherboard, please make sure that all the items listed below are present in your package：

➢ TA33 Motherboard
➢ User Manual

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

## *Customer Service*

We provide service guide for any problem as follow steps： The first, contact with your distributor, sales representative, or our customer service center for technical support if you need additional assistance. You may have the following information ready before you call：

➢ Product serial number
➢ Peripheral attachments
➢ Software (OS, version, application software, etc.)
➢ Description of complete problem
➢ The exact wording of any error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

## *Safety Precautions*

◆ **Warning!**

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronic personnel should open the PC chassis.

◆ **Caution!**

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

## Safety and Warranty

1. Please read these safety instructions carefully.
2. Please keep this user's manual for later reference.
3. Please disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall could cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
12. Never pour any liquid into an opening. This could cause fire or electrical shock.
13. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
14. If any of the following situations arises, get the equipment checked by service personnel:
    A. The power cord or plug is damaged.
    B. Liquid has penetrated into the equipment.
    C. The equipment has been exposed to moisture.
    D. The equipment does not work well, or you cannot get it to work according to the user's manual.
    E. The equipment has been dropped and damaged.
    F. The equipment has obvious signs of breakage.
15. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -20° C (-4°F) or above 60° C (140° F). It may damage the equipment.

## *Revision History*

| Version | Date | Note | Author |
|---|---|---|---|
| 1.0 | 2013.7.24 | First Release | Karen Liu |
| 1.1 | 2014.8.21 | Update | Seven Fan |

# Contents

# General Information

CHAPTER **1**

This chapter includes the TA33 Motherboard background information.

Sections include:

- Introduction
- Feature
- Motherboard Specification
- Function Block
- Board Dimensions

# Chapter 1  General Information

## 1.1  Introduction

TA33 SBC is an integrated package that provides customers a complete RISC platform for project evaluation, application development and solution feasibility testing that decreases lead-time and lowers initial cost and investment.

In peripheral connectivity, TA33 SBC features with one LAN port which supports PoE (Power over Ethernet), six USB 2.0 connectors (two type A connector; four Pin Header ), three COM port (RS232/422/485 selectable; one D-Sub connector; two Pin Header), and one Micro SD card reader.

## 1.2  Feature

- ➢ 3.5" Form Factor ( 146mm x 101mm)
- ➢ Supports TI Cortex$^{TM}$ – A8 AM3354 720MHz processor
- ➢ Android 4.1.2 / WinCE 7.0 / Linux supported
- ➢ LVDS interface supporting up to 1366x768
- ➢ 1 x micro SD/SDHC Card Slot
- ➢ Built-in NAND flash memory
- ➢ Power Over Ethernet (PoE) supported
- ➢ Optional CANbus support
- ➢ Optional Wifi support

## 1.3  Motherboard Specifications

| | |
|---|---|
| **CPU Type** | TI Cortex A8 AM3354 720MHz |
| **CPU Speed** | 720 MHz |
| **LCD interface** | LVDS interface supporting up to 1366x768 |
| **LAN** | 1 x Giga LAN (supporting PoE function ) |
| **Memory Type** | 512MB DDR2 SDRAM 533MHz |
| **Built-in Storage** | 1GB Nand Flash |
| **Audio** | 1 x Mic Input(2 pin)<br>2 x Stereo Speaker Out(2 pin) |
| **Edge Connectors** | 1 x 2.5Ø DC Jack<br>1 x 9 Pin D-Sub CANbus PinOut (optional)<br>2 x USB A-type (Host)<br>1 x RS232/422/485 selectable<br>1 x RJ-45 10/100/1000 (Support PoE function)<br>1 x Micro SD Card Slot |
| **On Board Pin-Header Connectors** | 1 x LVDS by pin-header (up to 1366x768)<br>1 x I2C Touch by pin-header<br>4 x USB by 2 pin-header (4 x 2 pin)<br>1 x RS232/422/485 by pin-header<br>1 x CANbus by pin-header (non-isolation)<br>1 x Digital I/O with 3.3V (8-pin GPIO)<br>1 x Reset by pin-header |
| **Dimensions** | 146 mm x 101 mm (3.5" Form Factor) |
| **Mechanical & environmental** | Operating temperature: -10 deg. C to 60 deg. C<br>Operating Humidity: 10 ~ 90% Relative humidity, non-condensing |

## 1.4    Function Block
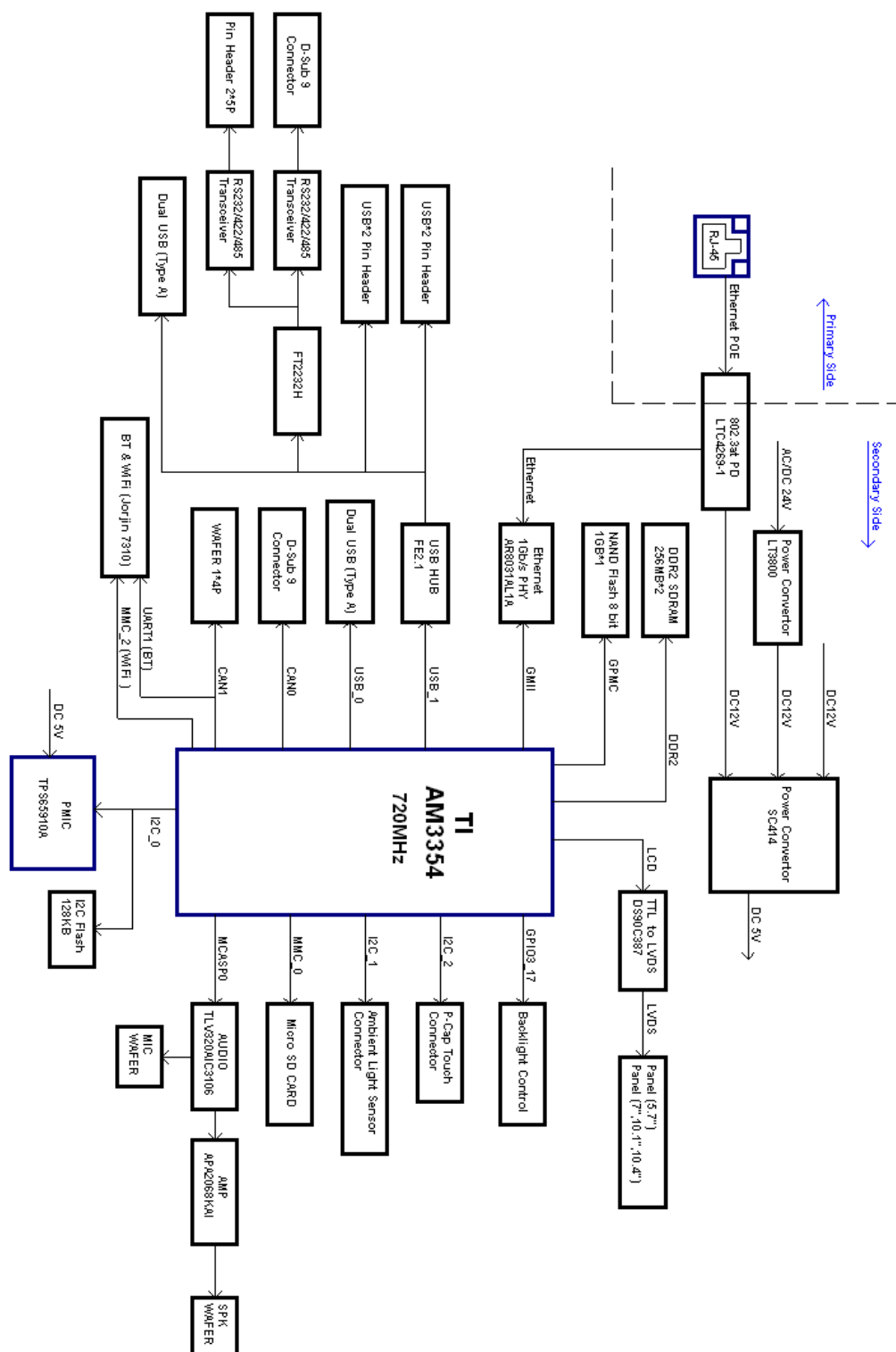
## 1.5   Board dimensions
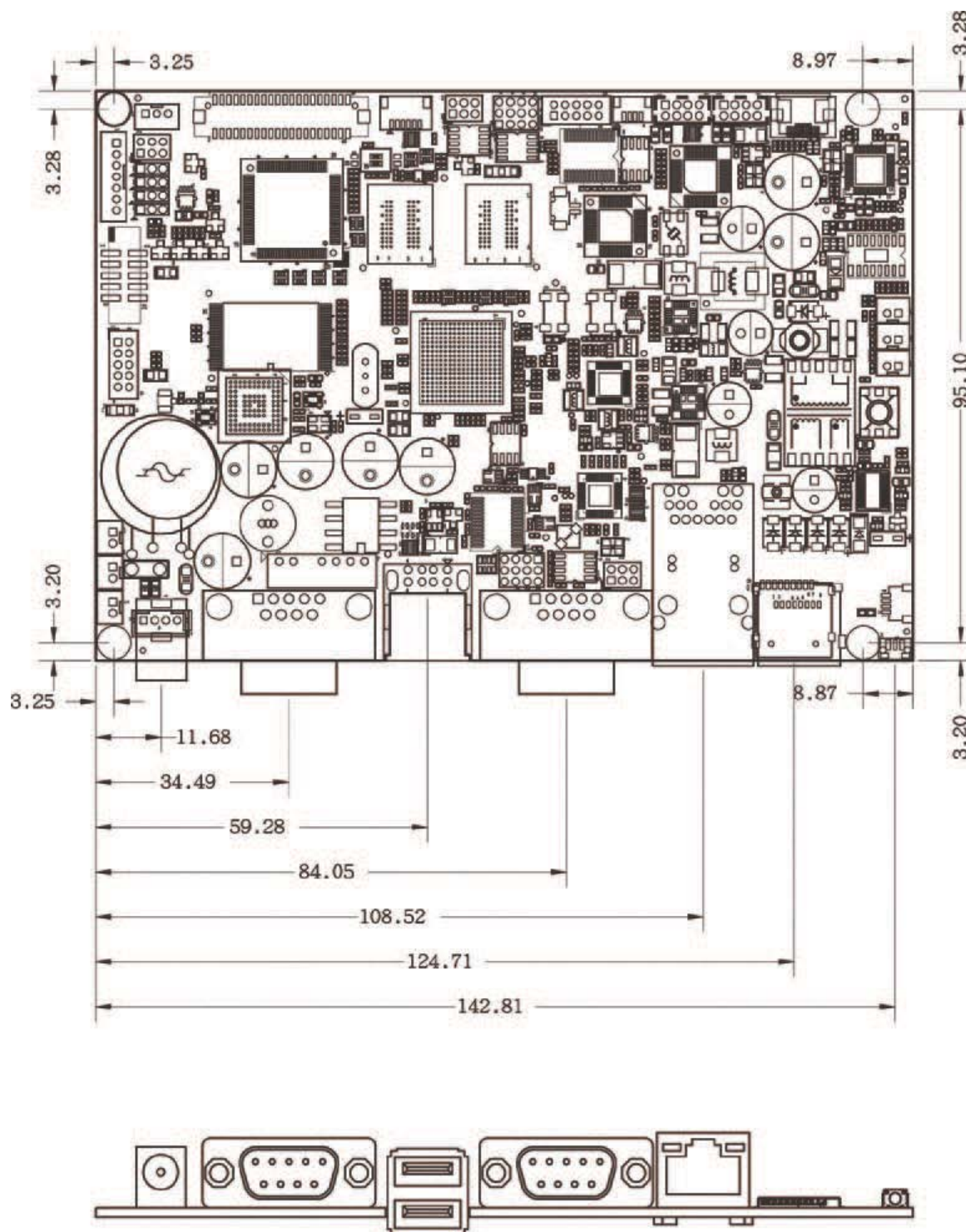
# Installation

This chapter provides information on how to use the jumpers and connectors on the TA33 Motherboard.

The Sections include:

● I / O Equipment Installation

● Jumpers and Connectors

● Setting the Jumpers

● Connectors and Pin Assignment

# Chapter 2 Installations

## 2.1 I/O Equipment Installation

## 2.2 12V DC-IN

The Motherboard allows plugging 12V DC-IN jack on the board without additional power module converter.

## 2.3 Serial COM ports

There are two built-in COM port (RS232/422/485 selectable; one with 9-pin D-Sub and the other with pin-header) on TA33. When an optional touch-screen is ordered with PPC, serial com port can connect to a serial or an optional touch-screen.

## 2.4 Ethernet interface

The Motherboard is equipped with one RJ-45 jack which is fully compliant with the PCI 10/100/1000 Mbps Ethernet protocol. The LAN port also supports PoE function (Power over Ethernet; 802.3AT).

## 2.5 USB ports

Six USB devices (Four with pin headers) may be connected to the system though an adapter cable.The USB ports support hot-plug connection.

## 2.6 Audio function

The audio interface includes three pin-header connectors on board: two for Stereo Speaker out (L/R) and one Mic in.

## 2.7 Jumpers and Connectors
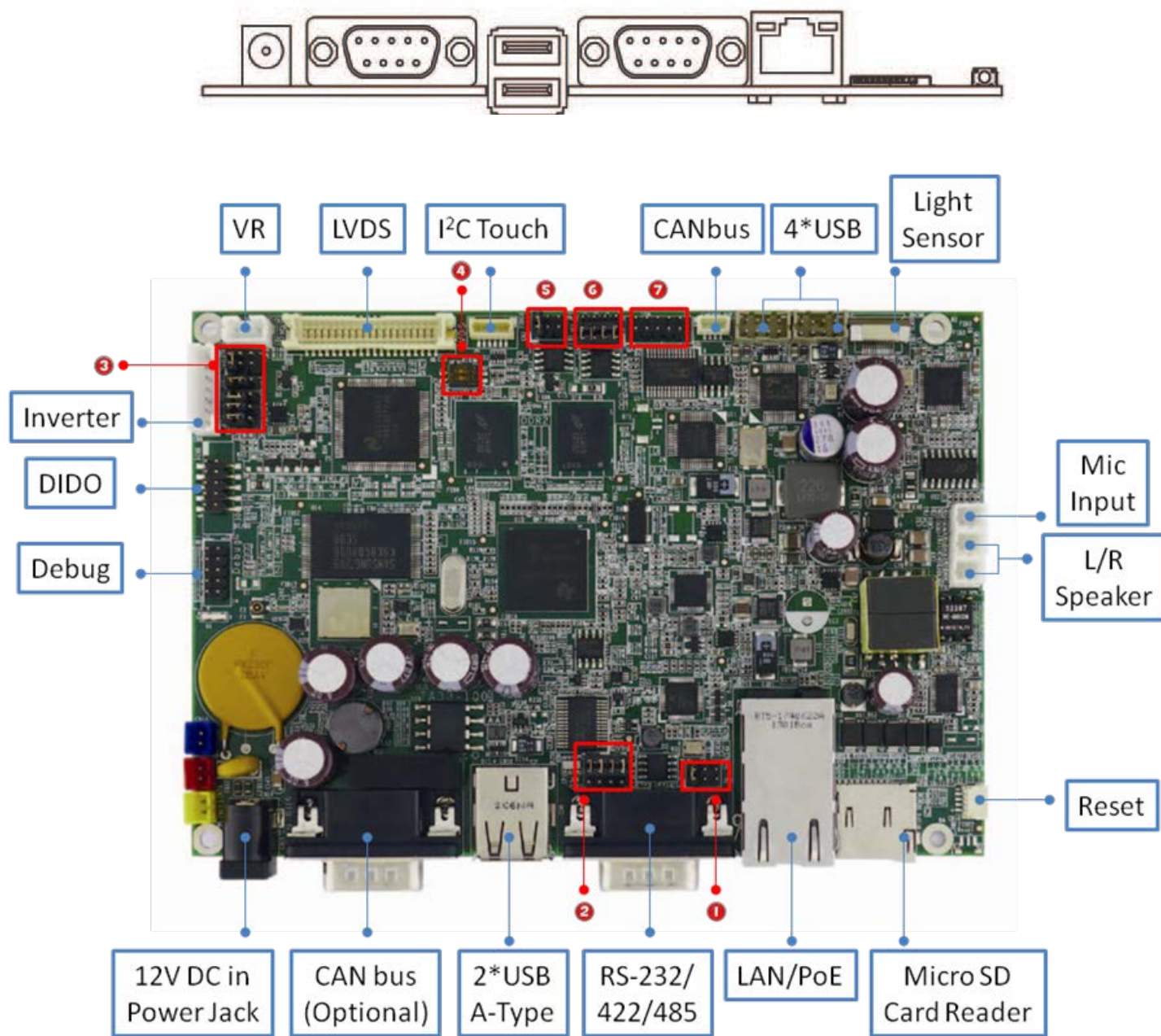


| | | |
|---|---|---|
| ❶ JP9-RS232/RS422/RS485 Circuit | | ❹ SW1-NAND Flash/SD Boot |
| ❷ JP8- RS232/RS422/RS485 Circuit | | ❺ JP1- RS232/RS422/RS485 Circuit |
| ❸ JP3-LVDS Power Select | | ❻ JP2- RS232/RS422/RS485 Circuit |
|    JP4-Backlight Power Select | | ❼ COM |
|    JP5-VR/Software | | |
|    JP6-PWM/DA | | |
|    JP7-PWM Level | | |

## 2.8 Jumper Setting

A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

The jumper setting diagram is as below. If a jumper shorts pin 1 and pin 2, the setting diagram is shown as the right one.
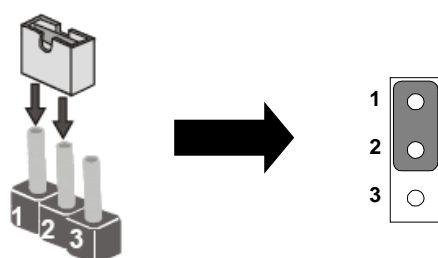
The following tables list the function of each of the board's jumpers.

| Label | Function | Note |
|-------|----------|------|
| JP1 | RS232 / RS422 / RS485 Selector | 2x3 header , pitch 2.0mm |
| JP2 | RS232 / RS422 / RS485 Selector | 3x4 header , pitch 2.0mm |
| JP3 | LVDS PWR Selector | 2x3 header , pitch 2.0mm |
| JP4 | Back Light PWR | 1x3 header , pitch 2.0mm |
| JP5 | VR/Software | 1x3 header , pitch 2.0mm |
| JP6 | PWM/DA | 1x3 header , pitch 2.0mm |
| JP7 | PWM Level | 1x3 header , pitch 2.0mm |
| JP8 | RS232 / RS422 / RS485 Selector | 3x4 header , pitch 2.0mm |
| JP9 | RS232 / RS422 / RS485 Selector | 2x3 header , pitch 2.0mm |
| SW1 | NAND Flash / SD Boot | |

## 2.8.1 JP1/JP2/JP8/JP9: RS232 / RS422 / RS485 Selector for COM port

Jumpers JP1 and JP2 are configured to operate the COM2 (Pin-header type) in
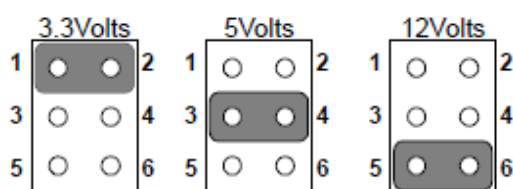RS-232/422/485 mode.
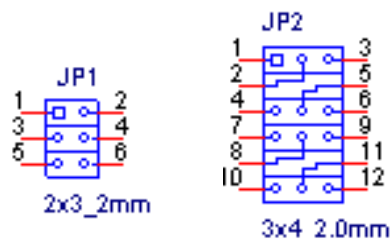


| JUMPER | RS232* | RS422 | RS485 |
|---|---|---|---|
| JP1 2x3 | 1-2 | 3-4 | 5-6 |
| JP2 3x4 | 1-2 4-5 7-8 10-11 | 2-3 5-6 8-9 11-12 | 2-3 5-6 8-9 11-12 |

Jumpers JP8 and JP9 are configured to operate the COM1 (9-pin D-sub connector) in
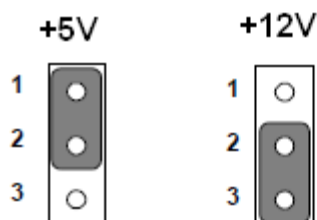RS-232/422/485 mode.
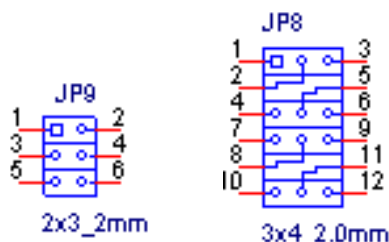


| JUMPER | RS232* | RS422 | RS485 |
|---|---|---|---|
| JP9 2x3 | 1-2 | 3-4 | 5-6 |
| JP8 3x4 | 1-2 4-5 7-8 10-11 | 2-3 5-6 8-9 11-12 | 2-3 5-6 8-9 11-12 |

## 2.8.2 JP3 : LVDS Power Selector



| Pin No. | Functions |
|---|---|
| 1 Short 2 | 3.3Volts Selected |
| 2 Short 3 | 5Volts Selected |
| 5 Short 6 | 12Volts Selected |

## 2.8.3 JP4 : Backlight Power



| Pin No. | Functions |
|---|---|
| 1 Short 2 | +5V |
| 2 Short 3 | +12V |

### 2.8.4  JP5 : VR/Software
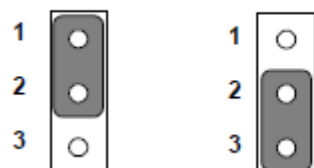


| Pin No. | Functions |
|---------|-----------|
| 1 Short 2 | VR Control |
| 2 Short 3 | Software |

### 2.8.5  JP6 : Brightness Control(DC/PWM)



| Pin No. | Functions |
|---------|-----------|
| 1 Short 2 | DC(VR) |
| 2 Short 3 | PWM |

### 2.8.6  JP7 : PWM Level
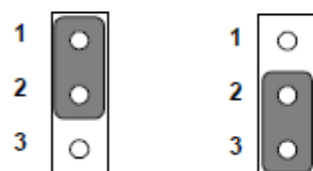


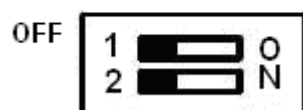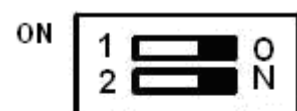| Pin No. | Functions |
|---------|-----------|
| 1 Short 2 | +3.3V |
| 2 Short 3 | +5V |

### 2.8.7  SW1 : NAND Flash / SD Boot

SW1 is designed to define the storage resource to boot from.



| ON | Boot from NAND Flash |
|------|----------------------|
| OFF | Boot from Micro SD |

## 2.9 Connectors and Pin Assignment

The table below lists the function of each of the board's connectors.

| Label | Function | Note |
|-------|----------|------|
| CN2 | LVDS LCD Output | 2*20p P:1.25mm |
| CN3 | I$^2$C Touch Connector | 6 Pin header |
| USB1 | USB PIN HEADER | 4x2 Pin Header |
| USB2 | USB PIN HEADER | 4x2 Pin Header |
| CN8 | Inverter | 7 Pin header |
| CN1 | VR - Brightness Control | 3 Pin header |
| CN9 | Digital I/O | 2x5 Pin header |
| CN6 | Light Sensor Connector | 6 Pin for FFC |
| CN10 | Mic Connector | 2 Pin header |
| CN11 | SPK_R | 2 Pin header |
| CN13 | SPK_L | 2 Pin header |
| CN16 | Reset | 4 Pin header |

## 2.9.1  CN2: LVDS Connector
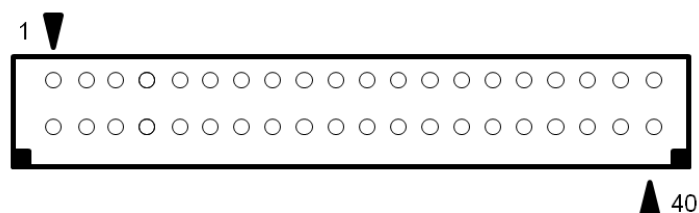


| Pin No. | SYMBOL | Pin No. | SYMBOL |
|---|---|---|---|
| 1 | LCDVDD | 2 | ATX0- |
| 3 | LCDVDD | 4 | ATX0+ |
| 5 | LCDVDD | 6 | ATX1- |
| 7 | GND | 8 | ATX1+ |
| 9 | GND | 10 | ATX2- |
| 11 | GND | 12 | ATX2+ |
| 13 | GND | 14 | ATXCLK- |
| 15 | GND | 16 | ATXCLK+ |
| 17 | GND | 18 | ATX3- |
| 19 | GND | 20 | ATX3+ |
| 21 | GND | 22 | BTX0- |
| 23 | GND | 24 | BTX0+ |
| 25 | GND | 26 | BTX1- |
| 27 | GND | 28 | BTX1+ |
| 29 | GND | 30 | BTX2- |
| 31 | GND | 32 | BTX2+ |
| 33 | GND | 34 | BTXCLK- |
| 35 | GND | 36 | BTXCLK+ |
| 37 | GND | 38 | BTX3- |
| 39 | GND | 40 | BTX3+ |

## 2.9.2  CN3: I2C Touch Connector



| PIN | NAME |
|---|---|
| 1 | Touch_VCC |
| 2 | GND |
| 3 | Touch_I2C2_SDA |
| 4 | Touch_I2C2_SCL |
| 5 | Touch_INTR_N |
| 6 | Touch_RST_N |

### 2.9.3 USB1/USB2
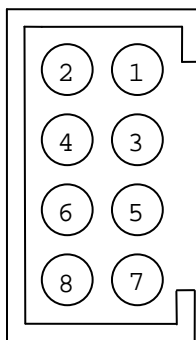
| Pin | SYMBOL | Pin | SYMBOL |
|-----|--------|-----|--------|
| 2 | USBVCC | 1 | USBVCC |
| 4 | USB - | 3 | USB - |
| 6 | USB + | 5 | USB + |
| 8 | GND | 7 | GND |

### 2.9.4 CN8: Inverter
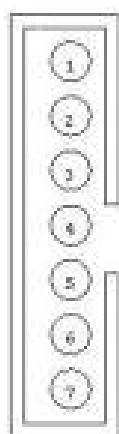
| PIN | NAME |
|-----|------|
| 1 | +BKLPWR |
| 2 | +BKLPWR |
| 3 | +BKLPWR |
| 4 | GND |
| 5 | BRIGHT |
| 6 | GND |
| 7 | BLON_5V |

### 2.9.5 CN1: VR - Brightness Power Control
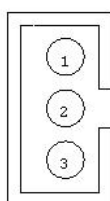
| PIN | NAME |
|-----|------|
| 1 | +V5S |
| 2 | BRIGHT |
| 3 | GND |

### 2.9.6  CN9: Digital I/O
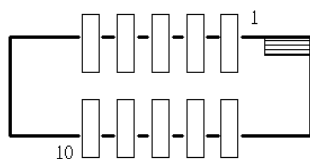
| PIN | NAME | PIN | NAME |
|---|---|---|---|
| 1 | GND | 6 | DOUT0_L |
| 2 | DIO_5V | 7 | DIN3_L |
| 3 | DOUT3_L | 8 | DIN1_L |
| 4 | DOUT1_L | 9 | DIN2_L |
| 5 | DOUT2_L | 10 | DIN0_L |

### 2.9.7  CN6: Light Sensor Connector
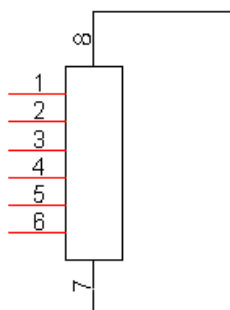
| PIN | NAME |
|---|---|
| 1 | Light_PWR |
| 2 | LED_R# |
| 3 | LED_G# |
| 4 | GND |
| 5 | LS_DATA |
| 6 | LS_CLK |
| 7 | GND |
| 8 | GND |

### 2.9.8  CN11 / CN13: SPK_R / SPK_L
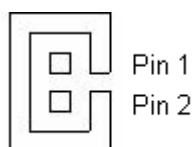
| PIN | NAME |
|---|---|
| 1 | LOUT+ |
| 2 | LOUT- |

### 2.9.9  CN10: Mic Connector
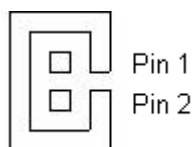
| PIN | NAME |
|---|---|
| 1 | MOUT+ |
| 2 | MOUT- |

## 2.9.10 CN16: User Reset / Interrupt Switches

| PIN | NAME |
|-----|------|
| 1 | +V3.3S |
| 2 | SYS_WARMRESETn |
| 3 | GND |
| 4 | GND |